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A DIAGNOSTIC CHART*

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It was one of those busy days, the time was all booked up on regular schedule for the afternoon, when we were confronted with one of those cases that tax the skill of the optometrist to the limit in making a diagnosis differentiating between a pathological and a physiological condition.

We were busily engaged in checking up the phorias with and without correction, taking the ductions, amplitude of relative convergence relaxation, cross-cylinder check, etc., when the secretary slips us a note stating: "Your are 20 minutes behind your schedule, the three o'clock is waiting and becoming very nervous." After many such experiences we were led to take an inventory of ourselves to determine if possible where there might be a leak that was consuming time unnecessarily and if possible to arrange a procedure of technique whereby this could be reduced to the minimum without lessening the efficiency.

We found that we were using from five to eight different near-point test cards that might readily be merged into one, thereby simplifying the routine of procedure, and saving much time and annoyance in making the change of the various cards.

There was the F-L tonicity, the duction, the suspension and supression, the vertical and cyclophoria, the cross-cylinder, the relative accommodation-convergence, and the near-point reading test.

After quite a little thought and experimenting we feel that we have solved the problem to a great extent, at least, in having been successful in condensing these various tests into one "Diagnostic Chart." (See figures I and II.) This chart eliminates the above objectionable features, making the work more pleasant, with much saving of time, and making it possible to have before our patients at all times a chart that is at least presentable in appearance and free from dirt, having had them printed in sufficient quantities that we may have a fresh chart as frequently as desired.

We shall attempt to analyze the significance of this near-point chart and to point out its advantages in some instances. On one side (see

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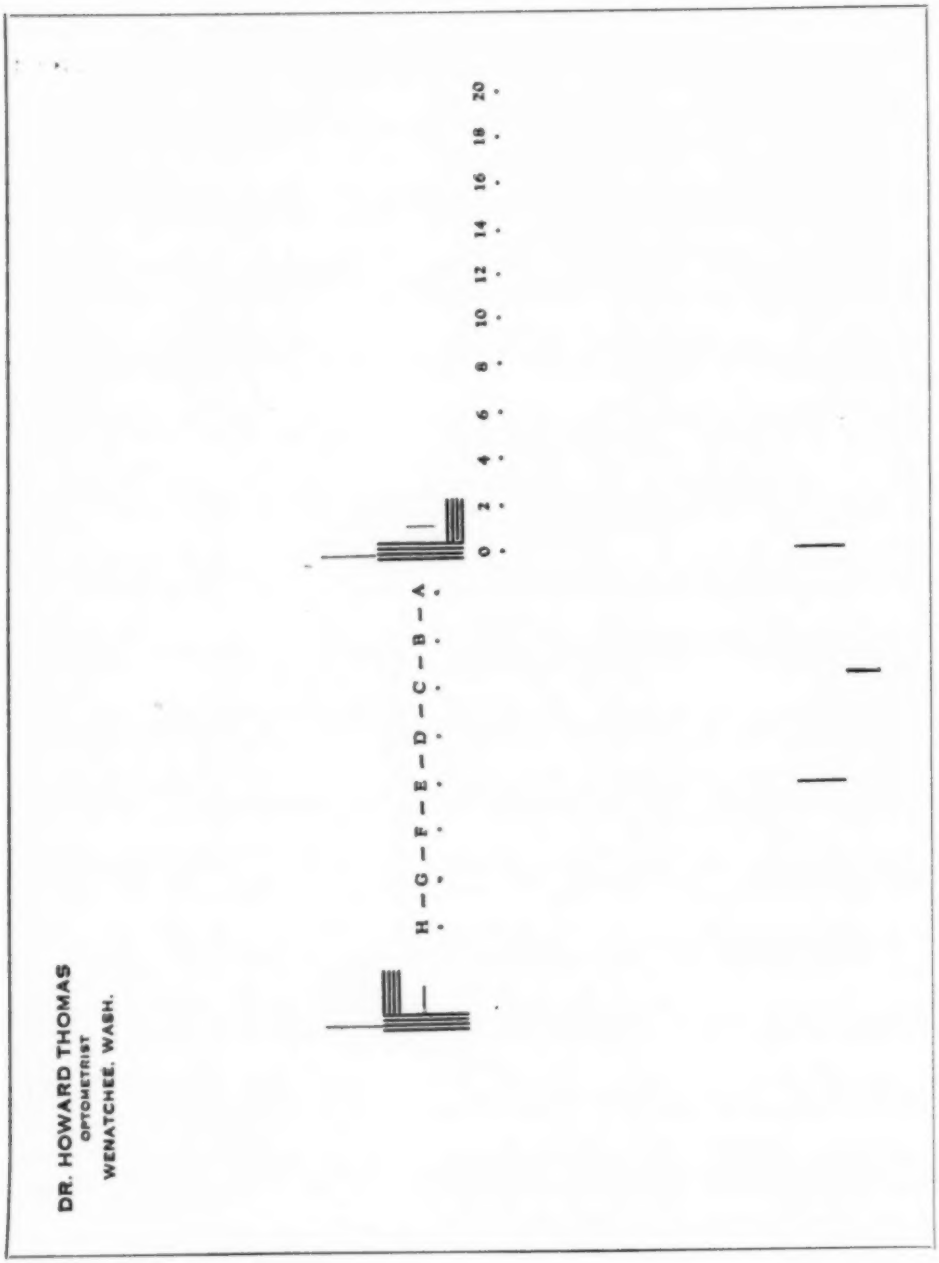


H. Thomas, Figure 1

figure I) are the large letters F and L placed in exact alignment 70 mm. apart with indicators at the top of each, with a light horizontal line forming a part of the F and L and a separate perpendicular line at the right of the L. Note that these large letters are made up of four carefully spaced lines forming the main stems of the letters, we here have an ideal cross-cylinder test object, incorporated in this is the F and L tonicity test.

The light horizontal and perpendicular hair-like lines (with the F and L fused to make an E) make a delicate suspension and suppression test. The lines extending above F and L serve as indicators in the phoria test. The spacing of dots below the horizontal line of figures and letters have a valuation of 2 D. at fourteen inches and are used as a scale of measurement, the figures representing the amount of exophoria and the letters the esophoria. The F and L with line of horizontal letters between serve as a target in taking vertical ductions when there is suspension or suppression present.

Near Point Phoria Test

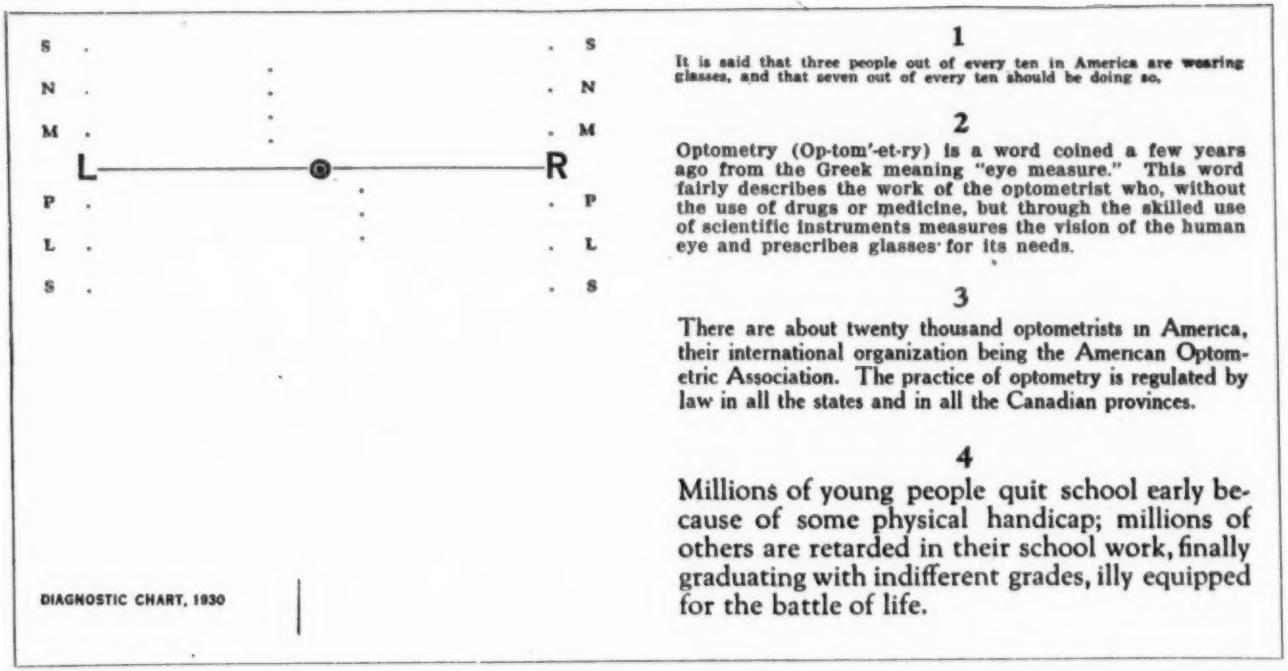
Align the letter L to median plane on the refractor bar—place 6 prism diopters base down before right eye or 3 prism diopters base down-right, and 3 prism diopters base up-left. Note position of lower letter L in relation to the upper one, asking patient to which figure or small letter the indicator of lower L points. This of course is the measure of the manifest exo or eso, as the case may be, the figures representing the amount of exo, and the letters the eso. Should patient state that indicator points to 6 or thereabouts, very good.

Then turn sufficient base in to re-align the L to zero, and should this require more prism power than is indicated by the figure "6," it shows sluggishness, not so good.

Should patient state that indicator points to the letter side this indicates an over convergence or esophoria, which is very bad and unless plus spheres will bring indicator to zero mark or better the case will require careful investigation. This is a most interesting and valuable near-point test and much information may be gleaned by a careful study of it. For illustration:

A young man, 25, requests a test to determine whether he could pass the aviation examination. Vision 20/10 O. U., near-point phoria test shows esophoria, or over convergence of 5 D. very bad. We turned in plus 2.00 spheres and the indicator immediately recovered the zero mark. Increased spheres to plus 2.50 and the indicator moved to figure 4, excellent. Then to satisfy our curiosity we refracted him and found plus 2.50 statically and he accepted plus 2.00 with clear vision at six meters.

Another case, young man, 24, optometrist, employed in our office, wearing plus 1.50 O. U., V. A. 20/10, exophoria, six degrees at fourteen inches. This young man has acquired the ability to relax by will power to about 15 Δ exophoria and again by the same will to converge to zero. He challenged us to prevent his ability to converge sufficiently to recover the zero point. We accepted the banter crowding on plus, requesting him to relax convergence as much as possible, which he did, the indicator of lower


S
N
M
L
R
P
L
S
1
It is said that three people out of every ten in America are wearing glasses, and that seven out of every ten should be doing so.
2
Optometry (Op-tom'-et-ry) is a word coined a few years ago from the Greek meaning "eye measure." This word fairly describes the work of the optometrist who, without the use of drugs or medicine, but through the skilled use of scientific instruments measures the vision of the human eye and prescribes glasses for its needs.
3
There are about twenty thousand optometrists in America, their international organization being the American Optometric Association. The practice of optometry is regulated by law in all the states and in all the Canadian provinces.
4
Millions of young people quit school early because of some physical handicap; millions of others are retarded in their school work, finally graduating with indifferent grades, illy equipped for the battle of life.
DIAGNOSTIC CHART, 1930

H. Thomas. Figure 2

L traveling up the scale as more plus was added, being thrown out of the picture at 20, when the lower F indicator took up the chase at zero, traveling up the scale to 4 when no more plus could be added. This made a total of 24 prism diopters of exophoria with plus 4.25 D. sphere.

Would each of these two similar yet dissimilar cases accept a fogging lens without base-in prism? And if not, why not?

Amplitude of Relative Convergence by Cross-cylinder Method

Place sufficient cross-cylinder power before each eye to cause slight blur using the L as a target binocularly, turning plus prisms to point where the horizontal lines show a bit darker than the perpendicular. This is past the limit of Relative Convergence Relaxation. Repeat as before with minus prisms, to point where the vertical lines show darkest, this being past the limit of Relative Convergence Plus, the sum of the two representing the Amplitude of Relative Convergence.

Remove cross-cylinder and take total adbuction with sufficient plus prisms to produce diplopia, again reducing to point where single vision is recovered, noting this on record card and take abduction with minus prisms in same way excepting in esophoria and myopia when adduction should not be taken.

It is now necessary to use a septum on refractor bar which may be cut from dark cardboard 30 mm. wide by 90 mm. high. This is used in connection with the F & L test and simply serves to intercept vision of the right eye from the F and of the left eye from the L. This we set in a regular card holder on refractor bar necessitating two such holders, accessible and readily removed.

Dis-associated Acc. Conv. Balance Test

Set septum at 8″ with diagnostic chart aligned for F & L at 14″. Place ten prism diopters base out each eye—total prism 20 D. Patient should now see E, but should he read F L there is an over-innervation and prism power must be added to fuse the letters. The difference between the normal twenty and the amount added equalling the measure of over-innervation. Should he read L F there is an insufficiency and prisms must be reduced to fuse letters, the difference between the normal twenty and the place where it is fused equals the amount of insufficiency.

Accommodation Convergence Balance

Align for F & L on refractor bar. Place six prism diopters base down right eye and vertically align the two letters. Place cross-cylinder before right to cause slight blur. Ask which are darkest, horizontal or vertical lines. If answer is horizontal add plus sphere. If vertical are darkest add minus spheres. Now placing sufficient cross-cylinder before left eye to cause slight blur of F and again ask which is darkest. If answer is horizontal add plus spheres, if vertical add minus spheres. If, in adding plus spheres the F should shift to right the least bit, correct with plus prism to re-align. This represents amount of latent exo. and the plus spheres, which were added, the amount of latent hyperopia. Check this by throwing out vertically aligning prisms, leaving in place only

the prisms which correct the latent exo. Align for letter L and take cross-cylinder test binocularly. If Horizontal lines show darker, add plus spheres each eye. If vertical are darkest add plus prisms.

Vertical Phoria and Cyclo-phoria Chart

On reverse side of card (see figure 2), we have the vertical phoria and cyclo-phoria chart. Punch a small clean-cut hole at the center circle, hold or fasten opthalmoscope light back of hole and take near-point ductions with maddox rod, same as at distance. The dots at either side of center hole have a valuation of one diopter each. The dots at ends have a valuation of five degrees each, figured on a radius of 70 mm. Illustration P equals five degrees of the circle, L ten degrees, and S fifteen degrees. The letters P L S abbreviating plus and the letters M N S abbreviating minus. For instance, should the streak extend from R on base line through L below the line, this would equal ten degrees plus cyclophoria left eye, or should the streak extend from R on base line to N above line, this would equal ten degrees minus cyclophoria left eye and vice versa with right eye. The streak will always deviate in the opposite direction to the tortion of the eye. Should eye tort nasalward from the top, the streak will tilt down in opposite direction.

This is the most trustworthy near-point vertical phoria and cyclophoria test we have yet found.

This is not intended in any way as a discussion on any particular phase of optometry but only as a suggestion to the theoretical minded for a practical application in technique.

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CASE REPORT TAIT TECHNIQUE*

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Miss A. F. D.
Aet 33
Occupation, saleswomen

History

Briefly, patient has had sick headaches upon rising in the morning which later cause her to stop work. Has been treated by family physician for one year for these headaches. This physician measured visual acuity and claimed that the trouble could not be from the eyes. Finally, in despair, patient was sent to an optometrist who found that even + 0.25 blurred the vision and did not prescribe glasses. Later patient was seen and put through the examination as used in the Eye Clinics of The Pennsylvania State College of Optometry. In condensed form the examination revealed the following:

External examination

Entirely negative.

Ophthalmoscope

Entirely normal.

Keratometer

O. D. 1.25 70/160 W. R. P. M. 44.25 D.
O. S. 0.75 85/175 W. R. P. M. 44.50 D.
(The above are the actual findings with no allowances.)

Tonicity (Uncorrected)

2 Δ exophoria for distance.
No vertical imbalance for distance.
6 Δ exophoria for 13″.
V. A. O. D. .8—O. U. 1.0 (Clason)
O. S. .8

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Tait Technique: Dynamic Skiametry

O. D. + 3.00 D. sph ⊃ — 0.75 D. Cyl. Axis 160
O. S. + 3.00 D. sph ⊃ — 0.50 D. Cyl. Axis 175

Tonicities (Corrected)

Ortho for distance.
12 Δ exophoria for 13″.
P. E. 12 Allowance 2.25 D.

True Correction

O. D. + 0.75 D. sph ⌒ — 0.75 D. Cyl. Axis 160
O. S. + 0.75 D. sph ⌒ — 0.50 D. Cyl. Axis 175
V. A. .7—

0.25 from True Correction gave .8, V. A.

Static and Subjective (Fogging)

O. D. — 0.25 cx. 160 O. D. .9—
O. S. — 0.25 cx. 175 V. A. 1.0 + O. S. .9+

Ductions (With True RX.)

	abd	add	supra	infra	N.F.R.	P.F.R.
O. D.	12(4)	12(4)	4(1)	4(1)	20(13)	10(1)
O. S.	11(4)	12(4)	4(1)	4(1)	21(12)	13(1)

Steropsis

No suspenopsia was manifested during one minute.

Tonicities (With True Rx.)

2 Δ exophoria for distance.
No vertical imbalance for distance.
8 Δ exophoria for 13″.

Discussion

From both a Static and a Subjective standpoint very little could be given the patient. However, the Tait Technique shows the following conditions:

By comparing the cylinder part of the True Rx. we find that these cylinders agree with the Keratometer while the cylinders of the Static and Subjective do not agree with the Keratometer. Such a condition where the lenticular astigmia irons out under the influence of accommodation (Convergent-accommodation) as shown under the Tait Technique as known as Temporary lenticular astigmia. It will be noted that about 0.50 D. of Temporary lenticular astigmia exists in this case. We note also that the V. A. with the True Rx. is in this case .7— by a comparison of the True Rx. and the Static and Subjective Rx. we note a ciliary cramp of 0.75 D. The existence of the ciliary hypertonicity is explained by the presence of the corneal astigmia which caused rapid fluctuations of the ciliary muscle in an attempt to accommodate for first one end of the interval of Strum and then the other. This was done in the interest of good vision. This explains the existence of the compensatory lenticular astigmia.

This patient was given the True Rx. with the following results. Only two headaches have bothered the patient since wearing this correction. One after a long hard day of shopping without the usual noontime meal and the other after eating a forbidden food (onions). The patient is extremely pleased with the results. A recent visit shows that a reduction of + 0.25 sph O. U. gives the patient a V. A. of 1.0 +.

In about 75% of the cases the V. A. is between 1.0 and 1.5 (Clason)

with the True Rx. Thus, we have at our disposal a practical technique by which we can give to the average patient on their second visit an unusual good visual acuity by using only objective methods.

With the True Rx, as a basis for the rest of the refraction, the third visit can be spent with the subjective test, positive relative accommodation, ductions, tonicities and steropsis. Thus, if required, the fourth visit can be devoted to field work and then we have a picture of the condition of this patient's pair of eyes from both objective and subjective standpoints.

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THE ACCOMMODATIVE EFFORT IN PRESBYOPIA*

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Landolt cites this case in his book, "Refraction and Accommodation of the Eye" (page 338). "Let us take the case of two emmetropes, one of whom is fifty-two and the other twenty years old. The former has a range of accommodation amounting to two dioptries, while that of the latter is of ten dioptries. In order to see distinctly at a distance of one metre, each must bring into action one dioptry of accommodation. This dioptry, however, represents half of all the accommodation which the former has at disposal, but only one-tenth of the total possessed by the latter. If, moreover, the younger of the two continues to accommodate, and brings the object nearer, he will notice a marked difference between the effort which permits him to bring it from infinity to a distance of one metre, and that which enables him to bring it from eleven to ten centimetres. It is true that, in both cases, distinct vision demanded a like amount of increase in accommodation—one dioptry. But, in raising it from O to one D, the person in question expends the first dioptry of all that he possesses, and still has nine in reserve; the tenth dioptry, however, is his last; it is brought into play after nine have already been expended, and when he has none besides it remaining. It is much more difficult to bring this last dioptry into action than it was to do the same with the first one.

"These examples suffice to show that the accommodative effort is not to be measured by any fixed standard, but finds its expression in the relation between the effect produced and the entire amount of accommodative power at disposal. It follows from this that the reserve fund of accommodation must have a relative, and not an absolute, value; it must be a quota of the range of accommodation."

It can be inferred from the above statement that the emmetrope having the ten diopter amplitude of accommodation, makes less effort to produce one diopter of accommodation than does the emmetrope having the two diopter amplitude. Now, let us give this some thought. Is this so? Yes, indeed, it seems reasonable and logical to believe that, since the crystalline lens offers resistance, due to a loss of elasticity; a physiological condition brought about by old age. But, the question that the writer of this paper is going to discuss in the following paragraphs is, *"Does the*

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Ciliary Muscle Actually Make This Effort to Produce This Diopter of Accommodation or Not?" The writer believes that it does not and will endeavor to prove it.

Savage says, that it has not as yet been disproven, that "Whatever may be true of other associated brain centers, it appears that the center of the ciliary muscles and the convergence center can have associated impluses run in one direction, that is from the former to the latter." According to this statement, it is, therefore, impossible for the convergence to stimulate the accommodation, but the accommodation can stimulate the convergence.

What are the ocular conditions that increase the accommodative convergence? They are:

1) If an object be fixed and brought closer to the P. P. of accommodation, the result produced by the crystalline lens is less than the effort. The resultant associated convergence should, therefore, produce an over-convergence, or a tendency of the visual lines inward.

2) Cycloplegias. This renders the ciliary muscle less responsive to its innervations, thus demanding increased ciliary effort, and in this way a proportionate increase of accommodative convergence.

3) Uncorrected hyperopia (presbyopia) will produce an accommodative convergence greater than normal. (Reason is self evident.)

In general, therefore, we may say that when the demand upon the accommodation is abnormally increased, convergence is increased also.

We may say that the conditions that render accommodation easier, is, when summed up, anything that will cause one diopter of innervation to produce more than one diopter of accommodation, or any condition, such as myopia, that demands less accommodative effort than normal for a fixed distance.

Normally we say that one diopter of accommodation stimulates one meter angle of convergence, and that one diopter of accommodation is the result of one diopter of innervation. Now let us take Landolt's presbyope, who we must not forget is also emmetropic, and make him produce one diopter of accommodation. How much effort is he making to supply this one diopter of accommodation? This we cannot exactly state since we know of no means by which it can be measured, but we can assume that the effort would be equal to an effort that the emmetrope, who has ten diopters amplitude of accommodation, would make, if he were made to exert five diopters of accommodation. According to this proportion both would have to exert one-half their amplitudes, and I believe that we can conclude that they would be making about the same amount of effort.

With due regard to the relative positive accommodation that an emmetrope should normally have at the age of fifty-two (one diopter), we can say that the presbyope is making three diopters of extra ciliary innervation to produce the same result that the twenty year old emmetrope does. (Five diopter effort, minus one diopter relative positive accommodation, and add one diopter for a distance of one meter, equals three

diopters of extra effort.) Now keeping the above facts in view, we can deduct that this extra effort should be accompanied with an extra accommodative convergence of three meter-angles, or for the skeptical readers let us say that he makes but two diopters extra effort. This should produce two extra meter-angles of accommodative convergence. Calculated on a basis of a sixty mm., pupillary distance, this would be twelve prism diopters of a tendency of the visual lines inward—Esophoria.

Let us stop for a moment and go to our files, pick out the presbyopic case records, examine them and ask ourselves these questions:

1) What is the nature of the muscle balance at thirteen inches; esophoric orthoporic, or is it exophoric? We see neither esophoria nor orthoporia; but plenty of exophoria, and in amounts that are far in excess of the physiological exophoria. According to Landolt we should have found esophoria or orthophoria, for does he not say that the ciliary muscle makes a greater effort, and should not this greater effort be correlated with an amount of accommodative convergence equal to the effort made, or a tendency of the visual lines inward as previously explained? Why then, is there a tendency of the visual lines outward manifested (exophoria)? *Exophoria is manifested because the ciliary muscle does not make a greater effort in presbyopia, and, therefore, it is a result of insufficient accommodative convergence.*

It is an agreed fact that normally there should be a fusional convergence of about one-third the actual amount of convergence in use for a given distance. This leaves but two-thirds of the total amount of accommodative convergence to be stimulated for a given distance. Our records show that on an average there are about twelve diopters of exophoria manifested at thirteen inches, or that the accommodative convergence is but one-third of the total amount in use (six prism diopters).

2) How are the fusional reserves; high or low? The writer believes that in standard conditions the convergence, as associated with accommodation, becomes greater, i. e., there is proportionately less physiological exophoria, as the accommodative demands are increased with the approach of the fixation object by virtue of the fact that the innervation required to produce the last diopter of accommodation is somewhat greater than that required for the first diopter, thus giving increased accommodative convergence and alleviating the demands upon the fusion convergence, and thereby indicating greater fusional convergence reserves at points closer to the eye. Yet our tests show that the fusional convergence reserves are low in presbyopic cases, thus proving that the accommodative effort is not as high as we have been led to believe. Surely, these adverse conditions should not be manifested if the ciliary muscle were making a greater effort than it normally should. Then what is the cause of these adverse manifestations?

It is now generally admitted in scientific circles, that all of the phenomena of conscious and unconscious acts, even in their most minute details are to be found in the physical processes of the brain and spinal cord. But questions as to the nature of these processes, and as to the par-

ticular notions we must form of the substrata of a spatially ordered perception, are questions that utterly elude us when we endeavor to form a precise idea of them. At all events no satisfactory answers have as yet been given to them. In orther words, a specific mode of functioning is pre-arranged (or provided for) by an innate mechanism.

It is a clinical and known fact that a hyperope, of say, five diopters with an amplitude of about 10 diopters, who can be compared with the presbyope, makes little or no effort to overcome his error by accommodating. Why? The writer believes that the mind of the individual knows that the error is high, and that it cannot overcome the error; or if it could overcome the error could not produce single comfortable binocular vision for any length of time. Being aware of this the mind makes no ciliary effort to correct the error. We can assume that there are two reasoning centers in the brain. One center of which we are conscious of, and the other of which we are not conscious of. Now supposing that a certain individual was in a hurry to go somewhere, and that he was taking short cuts so as to save time. In the line of his direction he comes face to face with a brick wall. The individual does not attempt to push the brick wall out of his right of way because his reasoning center (conscious center) has advised him that the wall is too strong for him, or that he has not the strength to push the wall out of his way. The individual is, therefore, forced to walk around the wall. The same problem confronts the ciliary muscle. No matter how much effort it makes the result will not be sufficient to produce single, clear, comfortable, binocular vision. (The lens not responding to the effort made due to the loss of elasticity.) The second reasoning center (unconscious center) knowing this, advises the motor center of the third nerve (floor of the fourth ventricle) not to make the effort. Due to the fact that no ciliary effort is made, we find, as we mentioned before, a greater fusional convergence than normal thus resulting in low fusional reserves, and exophoria far in excess of the normal physiological at the distance of thirteen inches.

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A SUGGESTED TRIAL SET FOR THE OPTOMETRIST*

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Up to the present time all trial sets appear to have been made from designs, probably more or less arbitrary, inherited without questioning from the past. They appear, moreover, to have been made to serve cycloplegic methods of refraction, leaving the optometrist to fare with them as best he could.

The two main systems of refraction used today by the optometrist are the fogging system (as in the Tait dynamic system, in static, and in subjective work), and the non-fogging system (as in Sheard's method of finding the "add" objectively in a case of presbyopia).

Let us imagine that we are doing a dynamic test on a young hyperope by the Tait dynamic system, and that we wish to change the spherical power before the patient's eye from + 4.50 to + 4.25. In the first place, using the average trial set of today, say, the standard 40-pair set, we would not have any 4.25 sphere, and if we did we would have to follow either of two procedures in making the change:

(a) Put the + 4.25 in the phorometer cell behind that cell holding the + 4.50 (thereby taking the risk of dropping the + 4.25) and then remove the + 4.50.

(b) Remove the + 4.0 and replace it by the + 4.25 (thereby allowing the accommodation to act, and to disrupt an otherwise perfect fog).

There is on the market a trial set which contains plus lenses in the form of "auxiliary lenses" for use with the fogging system. This would be excellent, except for the fact that these "auxiliary lenses" are calculated to be inserted into the same phorometer cell as that for which the cylinders are designed. In other words, only two lenses at a time may be used if the advantages of additive power are to be had. Since a sphere, an auxiliary sphere, and a cylinder are three lenses the advantages of strict additive power are lost and the "auxiliaries" might as well not exist. It has occurred to the writer that if the auxiliary sphere and the cylinder were combined into one lens, to be additive with the spheres as auxiliary sphero-cylinders with the minus cylinder axis marked, a number of significant advantages could thus be made to obtain for the optometrist. Needless to say, such a trial set could be made only with lenses having a constant center thickness and strictly true, additive, vertex powers between

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the spheres and the cylinders.

For the sake of simplicity let us consider a sample of such a trial set:

Spheres, plus and minus
0.00 to 10.00 in .25 D in pairs.

Cylinders, Minus only (additive with spheres)
.25 — 6.00 in .25 D in pairs

Sphero-cylinders (additive with spheres)
+ 10.00 sphere to + 10.00 ⊃ — 6.00 cylinder in pairs, in .25 D for cylinder power (spherical element constant)
— 10.00 sphere to — 10.00 ⊃ — 6.00 cylinder in pairs, in .25 D for cylinder power (spherical element constant)

Prisms: Single pieces
.25 Δ to 2.5 Δ in .25 Δ steps

Miscellaneous: As usual.

Following is the technique: (fogging)

In all cases insert the cylinder indicated by the keratometer (making allowance for corneal distance, and taking into consideration whether the case is hyperopic or myopic). This may mean a plano-cylinder or a sphero-cylinder.

Simple or Compound Myopia: (Up to 10.00 D)

Technique same as with other trial sets; plano cylinders and minus spheres, building up minus power.

Above 10.00 D:

Insert into the proper cell the — 10.00 sphere auxiliary, or the — 10.00 ⊃ proper-minus-cylinder auxiliary at the indicated axis, then as before, build up minus power over this with the minus spheres in the sphere cell.

Simple and Compound Hyperopia (Up to 10.00 D)

Insert into the proper cell the + 10.00 sphere auxiliary or the sphero-cylinder auxiliary having the indicated cylinder. Then add over this minus spheres, building up minus power over the plus sphere element of the auxiliary.

When the desired point is reached the power before the patient's eye is the algebraic sum of the spheres and the cylinder power is the cylinder as it exists in the auxiliary with its axis unaltered. Thus:

Auxiliary	+ 10.00	⊃	— 1.25	CX 180°
Sphere	— 5.25			
Equivalent	+ 4.75	⊃	— 1.25	CX 180°
Auxiliary	+ 10.00	⊃	— 2.50	CX 60°
Sphere	— 10.00			
Equivalent			— 2.50	CX 60°
Auxiliary	+ 10.00	⊃	— 1.50	CX 90°

Sphere	— 9.00
Equivalent	+ 1.00 ⌒ — 1.50 CX 90°
Auxiliary	+ 10.00 Sphere
Sphere	— 9.75
Equivalent	+ 0.25 Sphere
Auxiliary	— 10.00 Sphere
Sphere	— 9.00
Equivalent	— 19.00 Sphere
Auxiliary	— 10.00 ⌒ — 5.50 CX 15°
Sphere	— 7.75
Equivalent	— 17.75 ⌒ — 5.50 CX 15°
Auxiliary	— 10.00 ⌒ — 2.75 CX 40°
Sphere	0.00 (plano)
Equivalent	— 10.00 ⌒ — 2.75 CX 40°
Cylinder	— 4.50 CX 85°
Sphere	0.00 (plano)
Equivalent	— 4.50 CX 85°

(If no sphere is indicated the plano must be used since only thus is the true cylinder power obtained.)

The advantages accruing from a trial set of this type may be stated thus:

1—*Simplified Technique:*
After choosing the proper auxiliary sphere or auxiliary spherocylinder (when an auxiliary is needed) all cases require the "building up" of minus spherical power in the sphere cell.

2—*Perfect Fog in All Combinations:*
In one operation the patient has been made myopic, and his astigma is taken care of. Besides, the changing of the minus spherical power is done with appreciable physical convenience.

3—*.25 Diopter Differentials Throughout:*
Never before available in any trial set.

4—*Strictly Additive Vertex Refraction:*
The cylinders and the auxiliary lenses are compensated for separation from the spheres, for their thickness, and for their index and curves. This allows the corneal distance to be taken into consideration in fitting the final correction.

5—*Never More Than Two Lenses Before Eyes:*
After the selection of the proper auxiliary (when indicated) there is only one variable, and this is the minus sphere. In skiametry reflections are reduced to a minimum.

6—*Elimination of Unnecessary Pieces:*
The plus cylinders of the average trial set are useless, since minus cylinders are called for in both the fogging and the non-fogging methods. Also the high plus spheres (above 10.00 D) are not needed.

7—More Nearly Accurate Measurements of Hyperphoria:

In the Maddox-rod tests for hyperphoria the rotary prisms do not give fractions of a prism diopter satisfactorily; while the .25 Δ steps of separate prisms are dependable.

The plus spheres are called for only in the non-fogging technique of Sheard for finding the "add" objectively in presbyopia, but since the "add" can be arrived at from a correlation of the patient's age, his near point needs, and his amplitude of accommodation even the plus spheres can be eliminated.

Various combinations can be worked out by the individual optometrist to meet his own needs. For those who already have a trial set whose lenses have a common center thickness and additive power advantages between the spheres and the cylinders, all that is necessary is the acquisition of the sphero-cylinder auxiliaries and the few prisms.

If the manufacturers received a sufficient number of orders for such trial sets, or for the auxiliary sphero-cylinders, it is reasonable to assume that they would be able to supply them at a cost which would be quite reasonable.

Regardless of price, however, the writer feels that the investment required by such a trial set would be well worth while, because of the fact that the speed and accuracy made possible by it are a reality which the optometrist can enjoy in his work every day of his professional life.

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THE PLUS CYLINDER AND JAVAL RULE IN OPHTHALMOMETRY*

Robert C. Demmery, Opt. D.
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As a constant user of the plus cylinder in all my work it was with considerable interest that I read and studied the article presented in the February number of The American Journal of Optometry by Dr. E. LeRoy Ryer and Dr. E. E. Hotaling on "The Minus Cylinder and Javal Rule in Ophthalmometry." If what they say is true, we who use the plus cylinder are indeed at error, particularly in reference to the use of the Javal Rule.

Recognizing the experience and reputation of these men it is with respectful questioning that I take exception to the things they say; and I do it not with a view to persuading them or others to the use of the plus cylinder in their work, but to try and put at ease the minds of those who might be disturbed by their arguments.

That the plus cylinder can be used with complete satisfaction in subjective and retinoscopic tests is known by those who use it. For the defense of its use in these tests I will leave to others, as I am chiefly interested in what has been said regarding the plus cylinder in reference to the use of the Javal Formula.

First, let us remember that lenses are applied, whether in testing or correcting, for the purpose of modifying and controlling the light as it enters the eye. This is their purpose and it is in the way in which they do this that determines their character in reference to the eye. Let us think of the light waves and not of the lenses for it is they which we are most interested in.

It has been said that plus lenses removed from the eye increase in effectivity and that minus lenses decrease. Such a statement is not necessarily true unless it be stated that the object looked at is at a great distance. For we all know and realize that removing a weak plus, under about 2.00 D from the eye when the object looked at is within 20 inches, will not increase in effectivity but will decrease.

This can be considered as an illustration of the fact that our ultimate concern is that of the condition of the light entering the eye. If the object is at such a distance that even after passing through the plus lens the light is still divergent, the removal of such a lense from the eye will lessen

*Submitted for publication April 2, 1930.

its effectivity. This is particularly interesting in the discussion since so many of the cylinders used are under 2.00 D and, after all, our chief problem is the correction at the near or working point. So, point one is this; plus cylinders of 2.00 D or less do not increase but DECREASE in power when removed from the eye and when used in close work, and so under these conditions there is no tendency toward over-correction as has been stated.

To illustrate my next point I will use three hypothetical cases, compounds with minus 4.00 cylinders with axis 180 in each, and each placed 15 mm. from the cornea.

CASE 1. +6.00 D. Sph ⊃ −4.00 D. Cyl. Ax. 180

which combination has +2.00 D. in the vertical meridian.
+6.00 D. in the horizontal meridian.

+2.00 has an effectivity at the cornea of +2.06 D.
+6.00 has an effectivity at the cornea of +6.62 D.

Cylindrical effect at cornea 4.56 D.

CASE 2. −6.00 D. Sph ⊃ −4.00 D. Cyl. Ax. 180

which combination has −10.00 in the vertical meridian.
— 6.00 in the horizontal meridian.

−10.00 has an effectivity at the cornea of −8.69 D.
— 6.00 has an effectivity at the cornea of −5.52 D.

Cylindrical effect at cornea 3.17 D.

CASE 3. +2.00 D. Sph ⊃ −4.00 D. Cyl. Ax. 180

which combination has −2.00 D. in the vertical meridian.
+2.00 D. in the horizontal meridian.

+2.00 has an effectivity at the cornea of +2.06 D.
−2.00 has an effectivity at the cornea of −1.94 D.

Cylindrical effect at cornea 4.00 D.

In Case 1 an increase in effectivity instead of a decrease is very apparent.

In Case 2 a decided decrease is noticed.

In Case 3 there is neither increase nor decrease, at least to the second place in the decimals. What do these indicate?

To me it seems very evident that the effectivity of a cylinder, whether increasing or decreasing, as the distance from the eye increases, depends entirely upon the sphere with which it is incorporated. And that is what would be expected; as in No. 1 where the light from infinity would leave the lens converging to different degrees in both meridians, as the distance increases the cylindrical effect will increase. But as in No. 2 where conditions are just opposite, the opposite effect, or a decrease is noticed. As in No. 3 where the light in one meridian is converging at about the same

degree as it is diverging in the other, there is little or no change in the cylindrical effect.

There may be some objection to my not considering the cylinder by itself, but this, I think, has been the source of the error; for after all, we are not only interested in the astigmatic error but must correct the general error with such lenses as are needed. If myopic, minus must be used and if hyperopic, plus must "back" the cylinder.

It might be interesting to enumerate the factors which are concerned in the determination of the cylindrical effect of a lens upon the eye.

1. Difference in power in the two meridians of the lens.
2. Type of lens—whether
   a. Plus in both meridians.
   b. Minus in both meridians.
   c. Plus in one meridian and minus in the other.
3. Distance of the object looked at.
4. Distance of lens from the cornea.

Factor one remains the same whether the cylinder be plus or minus for there is the same difference in power in the two meridians in +2.00 combined with −2.00 cyl. as +2.00 combined with +2.00 cyl.

Factor two depends not upon the type of cylinder but upon the sphere with which it is used. A minus cylinder can be used in forming a compound with plus power in both meridians if sufficient plus sphere is used and the reverse also is true.

Factor three, considering the object to be a great distance this can be disregarded.

Factor four; closely linked with the consideration of the form of the light leaving the lens, whether converging or diverging.

Note that the form of the lens, whether using a plus or minus cylinder is no consideration and is not a factor in its final effectivity at the cornea.

What of the Javal Rule, then? To quote Drs. Ryer and Hotaling: "Hence the Javal Rule as it stands cannot be expected to work for both minus and plus testing values nor to our minds, can any single formula." This statement is based on their contention that the factor of 1.25 in the formula is to compensate for the loss of power by removing a minus cylinder from the eye.

Is it known definitely that Javal had this in mind when formulating his rule, or can it be that this is a misunderstanding that has crept into the interpretation of his work? For what of Case 1 and similar types where the effectivity is increased?

These observations disclose, I believe, three points which cannot be refuted.

1. The sphere element of a compound and not the form of the cylinder determines whether the lens removed from the cornea will have

an increased or a decreased effectivity; so that;

2. Whatever the 1.25 factor in Javal's formula may be for, it is *not* to compensate for the loss of power by removal of the lens from the cornea.

3. If these two be true, undoubtedly it matters not whether minus or plus cylinders be used, for if Javal's Rule will work for the one it will prove equally satisfactory for the other.

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THE TEMPORARY USE OF RED GLASS BEFORE THE FIXING EYE IN SQUINT CASES*

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Naturally, this subject being new and still in the experimental stage may seem to be rather crude and jerky in the presentation of it to you this evening. I hope that you will pardon the inability of the speaker to get into words adequately that which he wishes to say upon the subject, and also that perhaps you may at least get an inkling of an idea which may help you to solve some of those baffling strabismus cases which we all have in our daily practice.

As you well know, there are many strabismus cases in which it is very difficult to measure the amount of deviation by means of the Savage phoria test or any other test. It is mainly due to the fact that one eye suppresses or suspends its image and try as we will it is well nigh impossible to produce two images. Unless we are able to accomplish this then, it becomes mere guesswork as to the amount and sometimes the character of the error. These are interesting cases to study, especially if one has a Kratometer and there are many phenomena which I hope will be discovered by this means in the coming years.

Long ago it occurred to the speaker that there must be something peculiarly attractive about the color red. It is an experience of all of you I am sure who have used it, to have observed the following. When a red glass, such as is regularly supplied in trial cases, is put before the one eye, the other left uncovered and a spot of light is observed such as has been used in the past for a muscle test, that the patient will report difficulty in regaining single binocular vision when the red glass is removed. With some the after-image remains for a considerable number of seconds, and with others the effect is not of enough consequence for them to call it to your attention.

It has been my experience that these patients whose recovery of single binocular vision is rapid are not in need of any muscle treatment. You will generally find their ductions and phorias satisfactory. Those, however, whose recovery is slow are nearly always candidates for some form or other of muscle or innervational treatment. Of course, this only so far applies to those people who do

*An Abridgement of the Material presented before the American Academy of Optometry at Chicago, Ill., Dec. 2nd, 1928.

not exhibit a strabismus. The same experiment has been tried with blue, green, smoke and amber but the effects were not appreciable to the patient. I sought for a reason for this phenomena for years, and then sometime ago I read an article by Shastid in which he went on to say that it was of great importance to him to find that eye specialists had not employed red in their various tests. He ascribed the same phenomena to red as I have found, that is, that it was an attractive color to the brain, and gave as a reason that its effect was stimulative, whereas most other color effects were sedative. Perhaps that is an additional reason why smoke, green, etc., are employed in cases of retinitis, although I have never seen that given as a reason. Then, again, red is a color which is seldom seen except in nature. In the fall it perhaps is the main reason why people exclaim about the beautiful foliage. Because foliage without red in it is passed by as being either commonplace or unattractive.

So much for the description of the reasons which led up to the employment of red as a color in a lens to aid us in our difficult strabismus cases. From time to time I have found men who did employ red in some form or other in the correction of eye defects. Peckham uses it considerably in the cards which are used in conjunction with the Kratometer and also at distance utilizing at times even the covers of Saturday Evening Post. These are nearly always printed in a bright red, and adapt themselves admirably for the purpose where it is necessary to build duction power, and there is suspenopsia present.

I think that the popularity of the Maddox Rod was due to the fact that nearly all of them are made of red glass, and the white one is not used when it is desirable to use one over each eye.

Let us take an explicit case, for example, suppose we have a case of convergent strabismus where the vision of the left eye is amblyopic, and also that eye is the greater offender as regards the strabismus. I think this is a somewhat typical case, and is the one which will occur most often in our various practices. Now, the ordinary manner of dealing with this type of case optometrically was to carefully refract it and suggest the bandaging of the right eye, and using the left one, in the hope that its vision would improve if it could be trained to be used more.

This was good advice as far as it went, but it did not go far enough. Also the Worth Black Amblyoscope was used in some instances. All of these agencies are good, but there are cases where seemingly they all fail to accomplish the desired result. With modern methods which are coming into use in optometry today that same case might employ these self-named methods of help, but additionally it has been found by Ryer and others that bifocals are indicated in most instances of this type of squint.

Peckham has added the Kratometer technique to this so that the result might be attained quicker and better. It would be my

pleasure to add this suggestion for the handling of the case. Order a separate pair of spectacles and use the regular distance correction in the left eye (the deviating eye) made of white glass, and the correction for the right eye (the fixing eye) made of a ruby red glass.

Now, the directions for use would be to place the glasses in a convenient spot so that immediately upon awakening they could be worn. In other words, the first visual impression which the brain obtains must be one of diplopia.

I instruct my patients to wear these glasses until their breakfast is finished, and as nearly all of them are children, it is not necessary for them to see singly until they go out of doors. In this manner it is possible to obtain from one to two hours per day with this correction being worn.

Occasionally I find that there is a patient who will suspend in spite of the red glass, and to all of the patients the instruction is given that while the red lens pair of glasses is being worn they must be conscious of a diplopia. If diplopia disappears then they must close the eyes for a second and, upon opening, there will appear the two objects. Sometimes you may find a patient who is able to fuse the red and white objects and then the color will be of a pinkish cast instead of either red or white. This happens more often with the alternating types of strabismus where the vision is nearly or quite equal in each eye.

There has been some question as to whether it was the proper procedure to make a patient see double. My answer is that ordinarily the child does not step from the cradle to his feet but rather assumes the creeping method before he learns to walk upright. It is exactly the same with eyes which have never had the incentive to see in a binocular single phase. It would seem also that the chances were much better to attain a correction of the difficulty in this manner than it would be to try to make the whole stride at once.

The reason for placing the red lens before the fixing eye, it seems to me, is nothing more than common sense, because the amplyopic eye already has enough of a handicap, so why increase it by dimming its image. I think it was Skeffington who advocated the use of a red lens, but this advice was to use it over the poor eye. I disagree with this for the reason stated. Moreover, if the red lens is used over the good eye it diminishes the intensity of the impression to a little better relation with that of the opposite eye, and perhaps this has something to do with the problem.

For the alternating type of strabismus it would, of course, be best to place the red glass lens over the better eye, if there is a difference, and if there is no difference, in the acuity then it is merely a matter of convenience. So far as I have been able to observe from very limited experience, it would seem best to place the red lens over the non-dominant eye where the squint is alternating and

the acuity equal in each eye. The reason is not yet apparent to me, but it seems to have a disagreeable effect if we interfere with the dominant eye in these cases.

While writing this paper, I received a letter from Dr. A. L. Young, optometrist of Junction City, Kansas. It seems that Dr. Peckham in speaking to a group of optometrists there recently mentioned the use of red glass and Dr. Young had the courage to try it. He found that it was a hard matter to obtain red glass blanks without waiting for a considerable time for them to be made so, being ingenious, he used some Eastman Kodak Kodoloid, ruby red in color. He first edges the lens of the white glass for the eye, which he has selected as being the proper one to interpose the red Kodoloid before. This edging is all done on the outside of the lens, similar to a watch crystal. He then cuts the Kodoloid to size of the eye-wire, and then places the white lens and the Kodoloid in the frame together. The tightening of the screw will flex the Kodoloid against the inner surface of the lens, and will obtain exactly the same result as would a red lens.

DISCUSSION.

DR. E. E. HOTALING: Eastman makes a light filter that we mix with the lenses to make them red. It is a thin material which comes in red and green. They have the complimentary colors. I do not know at this moment the technical name, they use it for their light filters for colored photography but just the smallest amount applied to the outside of the lens does very nicely. There is only one bad feature of it, the fact that the patient has difficulty in cleaning the lens. They have to be careful not to moisten it.

DR. B. S. PALMER: May I suggest that you use two thin white lenses, grinding one the way Dr. McCulloch has shown there, grinding the other with the opposite bevel, and then put your materials between those, placing both lenses into a fit-over frame so that the patient could easily take them off and put them on. This would overcome the difficulty of cleaning them.

CHAIRMAN E. G. WISEMAN: What has been the process in those cases where you have used this red lens therapy? Have you any specific records pointing out that the two objects have definitely approached one another and finally fused?

DR. O. L. MCCULLOCH: Several cases, one in particular. Here is what was done. A woman, age 35, visual acuity in subnormal eye 5/50. The other eye was normal. Subnormal eye had five diopters of astigmatism. Some progress made with the Kratometer, and then it seemed we could not get farther, even though I had her come in for treatments every day. We subjected her to the red lens therapy and the acuity in the eye gradually came up, and fusion

slowly commenced to exert itself. Today the vision in each eye is practically the same, although the left one is not quite as good as the right, but practically so.

CHAIRMAN E. G. WISEMAN: I judge you used the red lens over the fixing eye, and you carried on your Kratometer treatments as well?

DR. O. L. MCCULLOCH: I dropped the Kratometer when I started the red lens therapy I thought the patient had enough.

DR. C. J. HATHAWAY: The object of the red glass therapy is to produce diplopia. In other words to make the brain centers conscious of the two images. I have a suggestion which I have used for some time. Either place a red glass before one eye, or, as I often do, use the red free on one eye and the red filter on the other, and then I use the old style of Geneva retinoscope with a slip head, having the patients watch the ball of light, bringing it up very close to the eyes until they see the two, the red on its proper side, then gradually receding with that until they fuse it into one.

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A DIFFERENTIAL DIAGNOSIS FOR IRITIS AND GLAUCOMA

From time to time optometrists are called upon to make a diagnosis where an error may involve the loss of sight of the patient. We cite for instance cases of Iritis and Glaucoma. Iritis is, as a rule, curable when properly treated through the removal or drainage of the area which is the seat of the infection causing the iritis and for that matter, glaucoma also can be arrested providing the diagnosis is made early in the progress of the disease. However, time in glaucoma is an important element and as optometrists it is of primary importance to both the patient and ourselves that cases of glaucoma can be easily and quickly differentiated from those of iritis. The loss of even a day in certain cases of glaucoma may prove fatal to the vision of the patient. Therefore, as diagnostitians, we must be able to make an accurate and rapid differential diagnosis between the two conditions.

Both have subnormal visual acuity; both suffer considerable pain and in both cases, the pupillary reactions are abnormal. There are, however, certain points of differential diagnosis which will enable the optometrist to send his glaucoma cases to the ophthalmic surgeon at once and which will also permit him to send his iritis cases to the Radiologist where the teeth, the maxillary antrum and the frontal sinuses can be X-rayed.

These points of differential diagnosis are as follows:

In cases of iritis one will find exudates or small dark spots along the

iris margin; the depth of the anterior chamber will be normal; the pupil will be decidedly contracted and usually irregular in shape and the iris itself under focal illumination will appear swollen.

In glaucoma cases there will be, however, no exudates; the anterior chamber will appear shallow; the pupil will be a little dilated and slightly oval in shape, usually with the long axes in the ninetieth meridian, and the pupillary reaction will be sluggish.

These points of diagnosis should enable an experienced practitioner to differentiate between his glaucoma and iritis cases and while these important observations are by no means new, we feel that the matter is of sufficient importance to again call the attention of the profession to these differential diagnostic signs.

C. C. K.

GENERAL ULTRA-VIOLET RAY TREATMENTS IN CASES OF PERNICIOUS MYOPIA

Hume in an article in the September, 1928, issue of the Eye, Ear, Nose and Throat Monthly says, "We cannot leave the subject of ultra-violet therapy without mentioning the fact that it may be possible to delay the progress of many cases of pernicious myopia in childhood by utilizing the ultra-violet radiation with a view to increasing the calcium content of the blood." He draws this conclusion from the fact that many fully developed myopic cases are found to be cases which have a low calcium content in the blood and while he is by no means sure that there is a connection, he does nevertheless point out the similarity and suggests perhaps a method of overcoming one condition and by means of this thus improving the other.

Irradiation with ultra-violet rays, it is a well known fact, will correct disturbed mineral metabolism in experimental animals. This is due to the calcium and phosphorous fixing properties of the rays. We do not know, I believe, whether or not the anti-rachitic vitamin D is formed within the tissues as a result of the irradiation with the ultra-violet rays or whether it is the direct biochemical effect, and it does not, in this particular problem, matter. The important fact is that the rays do cause a deposition of calcium in cases where this function is depressed, and in these cases it is claimed by means of proper application of the ultra-violet rays a calcium deficient patient can be restored to normalcy. In fact this has been demonstrated clinically many times.

Therefore in any case of pernicious myopia, especially in children it would, the writer believes, be well to advise general ultra-violet ray treatment.[1] In this the writer is not advising that these general ultra-violet ray treatments be given the child by the optometrist. Our work is in the diagnostic and refractive field. However, after prescribing optical appliances for the case and possibly base-in treatments should they be indi-

cated,—he believes it would be well to have the child's blood examined and if the calcium content is low to have the child treated by some medical practitioner specializing in ultra-violet therapy. These cases must of course be kept under constant supervision.

In this same connection, Kurtz suggests including in the child's diet irradiated foods, these, it is said, assisting materially in increasing the calcium content. These foods would be particularly advantageous should this theory prove of value, in those cases where for one reason or another, no ultra-violet treatments could be given.

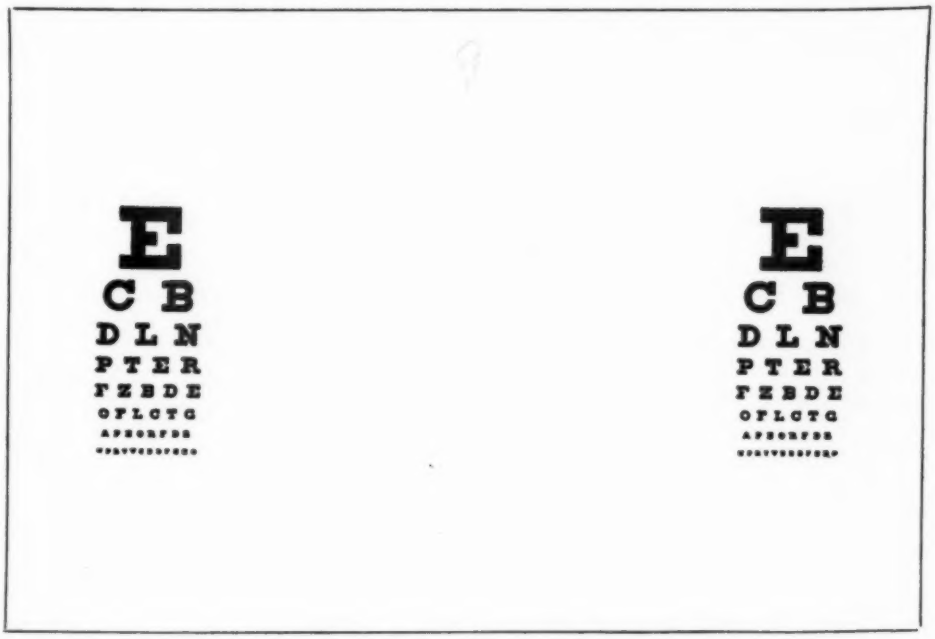
C. C. K.

[1]Ultra-violet radiation as generated with a Mercuric Quartz or Carbon Arc Lamp, administered to the entire body.

ABSTRACTS

COMMENTS ON BINOCULAR VISION. L. Jaques. The Genothalmic Forum. July, 1930. No. 7.

Jaques refers to the F. L. card used with the kratometer and having established during the refraction the absence of suspenopsia and secured various other binocular data with this F. L. card suggests then the use of the following two cards and technic. With the septum of the kratometer



L. Jacques, Figure 1

in place, the card appears exactly as pictured in figure 1 if the visual acuity of both eyes is equal. The right eye viewing the right image and the left eye viewing the left image, thus making a quick and easy comparison test.

Adding prisms base-out, according to Jaques, until the images fuse gives you a wealth of diagnostic information. Cases of high exophoria sometimes fuse without prism base-out or with five or six degrees. If vision is normal and fusion is good, the two images merge and clear vision results at once. If the images are unequal due to amblyopic or similar causes and fusion brings instant clear vision, equal to the better or dominant eye, you have a case of good binocular function.

L. Jaques, Figure 2

Continuing further claims Jaques, we have an interesting study of the "Blur-Point." Directing attention to the smallest readable letters, continue adding base-out prism until the patient can no longer read that line of type. Then direct attention to the big E and continue adding prism until fusion breaks. If the absolute blur-point is say 25Δ, and the break 40Δ, the inference to say the least is, that there is close hook-up between convergence and accommodation. This would, according to Jaques, be a case for a prism base-in or inhibiting treatments. If, however, the blur-point is 38Δ and the break 40Δ, you can almost rest assured that there is a very loose hook-up and you must, claims Jaques, "tighten it up" with base-out treatments or crowd the plus. However, it must be remembered

that 20 degrees base-out is the point from which above deduction is made. Jaques adds a word here about the blur-point, saying that for several years he tried to take the blur-point with a vertical line of type. This gave poor results. The new card, he claims, is absolutely correct according to Snellen Types and fills the visual angle of 20/20 etc. at 20 inches. If a patient has 20/20 vision, you take the blur-point with that line of letters. To Jaques "blur" means when the type cannot be read at all, not merely when the type starts to blur.

On the card shown in figure 2 the blur-point is taken from the point of rest, for instance, in a case of 6 degrees of exophoria at 20 inches, the prism is slowly changed from 3 degrees base-in O. U. to some equal amount of base-out O. U., until the blur-point is reached. As an example, if that point is 4 degrees base-out and break is 20 degrees base-out, the blur-point is 6 degrees, plus 4 degrees, or 10 degrees which is one-half of the blur-point. It is fairly well established, claims Jaques, that if the blur-point is one-third of the break, base-in treatment indicated, and if it is two-thirds of the break, base-out treatments are indicated. At the near point, the Blur-Point is taken both base-in and base-out.

C. C. K.

CONGENITAL AMBLYOPIA. J. Mansell. The Optician. (British). Vol. LXXV, No. 1942, p. 315. 1928.

Mansell claims that congenital amblyopia is a condition brought about chiefly by certain congenital defects of structure, for example, coloboma of the iris and choroid, and deficient development of the entire eye. Retinal hemorrhages in the new-born explain some cases; many cases of blindness are dependent upon hereditary influence, syphilis chiefly, then tuberculous disease, and meningitis. The condition usually is unassociated with fundus lesions, although in some instances the papilla is discolored and the macula deeply pigmented, and there is a scotoma, small and absolute, or larger and for colors only. According to some authorities a central scotoma is present in 90 per cent of the cases. There is little doubt that faulty vision exists from birth, and, frequently, high grades of refractive error, particularly hyperopia and astigmatism, are present, and clear images, therefore, are never focused upon the retina. Correction of the optical error does not materially improve vision; the retinal images remain defective.

T. O. B.

ANNOTATIONS AND SOCIETY PROCEEDINGS

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PUBLICITY AND EDUCATION

We note with interest that the American Optometric Association has now arranged for a publicity campaign in which some Six Millions of Dollars are, if the present plans carry, to be spent during the next four years. This is, without a doubt, the largest campaign of its character ever undertaken by our National Association and we feel that this project, if capably managed, can produce a tremendous amount of good.

In the first place, the mere raising and spending of large sums of money draws the entire profession together more closely. An organization into which all members are paying substantial amounts naturally holds the members' interest far more than one which costs next to nothing to belong to. In the second place, a publicity campaign of the magnitude arranged for by the A. O. A. would unquestionably focus the attention of many people upon the optometrist and his work and, thirdly, a publicity campaign costing Six Millions of Dollars and lasting four years would, we believe, arouse a desire upon the part of many young people to become optometrists. This third factor is extremely important and should never for a moment be lost track of. The future of the profession depends upon the young men and women who can be molded, by our Universities and Private Colleges, into professional optometrists.

A drive of the character just referred to will unquestionably arouse the interest of many a High School student who is about to choose his life work. Because of these facts we must not, in our enthusiasm for this new drive, forget the need our own optometric colleges have for our support. Not only must the optometrists of America support the A. O. A.'s cam-

paign, giving this their fullest and heartiest co-operation, but they must also see to it that our educational centers of learning are kept up to the finest and loftiest possible level.

The Pennsylvania State College of Optometry is at the present time engaged in a campaign to raise a Million Dollars for new physical equipment in which to house its growing student body and we must remember that other of our State owned and Private Schools are in similar need for various improvements which would go far towards enabling them to do better work with the students.

The proposed publicity campaign is splendid and must be carried through with dispatch. However, we must not neglect, in our zest for publicity, the educational centers which, in the final analysis, constitute the very heart of our profession itself.

C. C. K.

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TWO NEW BOOKS

We are publishing during the next 30 days two new optometric books. On August 1st, *Volume IV of the American Academy of Optometry* will be off the press. This volume contains the Transactions of the Annual session of the American Academy of Optometry held at Boston, Massachusetts, last December. Original papers from such well known writers as Wiseman, Doane, Bennett, Feinbloom, Drakeford, Hall, Ryer, Kurtz, Hotaling, Padleford and Tate are included.

The cost of this volume in cloth, 180 pages, 40 illustrations, is $5.00. Optometrists wishing a copy should send checks to Dr. J. Fred Andreae, Lexington Building, Baltimore, Maryland.

On September 1st, *The Principles and Practice of Ocular-Physical Therapy for Optometrists* by Kurtz will be ready for distribution. This volume deals with the purely optometric application of various forms of physical therapy, and in it the author lays a ground work for further study and research in this highly specialized subject.

For the past six weeks advance orders for this volume have been accepted. 200 pages, illustrated, in cloth, at $3.50. Those wishing to place an order should do so direct to Dr. J. I. Kurtz, Foshay Tower, Minneapolis.

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UNITED STATES PUBLIC HEALTH RESEARCH

According to pamphlet No. 331, recently printed by the United States Public Health Department, the five primary causes of glare when artificial lighting is used are as follows:

1. *Brightness of Source*—The light source may be too bright; that is, it may be of too high a candlepower per square inch of area.

2. *Total Volume of Light*—The light source may be too powerful for comfort; that is, it may be giving off too great a total candlepower in the direction of the eye.

3. *Location in the Field of View*—A given light source may be located at too short a distance from the eye or it may lie too near the center of the field of vision for comfort.

4. *Contrast With Background*—The contrast may be too great between the light source and its darker surroundings.

5. *Time of Exposure*—The time of exposure may be too great—that is, the eye may be subject to the strain caused by a light source of given strength within the field of vision for too long a time.

Mr. N. Singer, President of the Soft-Lite Lens Company, was, we believe, instrumental in arousing an interest among Public Health men in this important matter. C. C. K.

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INTERNATIONAL OPTICAL CONGRESS

The International Optical Congress will be held at Trinity College, Cambridge, England, September 6th to 11th, 1930. British Optical organizations are acting as hosts at this meeting, during which the International Optical League will also be in session. For particulars optometrists may write to Dr. J. H. Sutcliffe, Cliffords Inn Hall, Fleet St., London E. C. 4.

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GRADUATE CLINC FOUNDATION

Sixty organized study groups are meeting regularly under the direction of Dr. A. M. Skeffington. These groups meet at weekly or bi-monthly intervals and discuss cases which are presented, as well as special papers which are prepared for the groups by the director, Dr. A. M. Skeffington. Ophthalmoscopy was the subject discussed during the June meetings.

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OPTICIANS IN ITALY

The following extract is from the Italian Foreign Letter of April 30, 1930, which recently appeared in the Journal of the American Medical Association.

Practice of the Auxiliary Sanitary Professions

The minister of the interior has called the attention of the prefects of the realm to the need of strict enforcement of the regulations pertaining to the practice of the auxiliary sanitary professions. All persons who practice these professions must be provided with a certificate based on the proper examination. A single exception is made in favor of hospital nurses, who, when their tenure of duty extends back at lease to August, 1927, may continue to practice their profession in the hospitals to which they are attached, though they may not have a certificate. This exception, however, refers solely to hospital service. The nurse who does not have a certificate may not practice her profession outside the hospital. The regulations provide also that the manufacture, testing for and sale of spectacles in general may be carried on solely by persons who possess the title of "optician." In like manner, only authorized orthopedists may supply prosthetic apparatus and trusses. Acts in contravention of these regulations subject the offender to penalties.

From the foregoing it would appear that only Italian "opticians" were permitted to engage in ocular refraction, the examination and prescribing of material being limited, exclusively to them.

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INSTRUMENTS AND TREATMENTS

As anxious as we are to see optometrists well equipped with diagnostic and treatment equipment we firmly believe that there is today, far too much talk and sales pressure exerted on certain pieces of treatment equipment for which many impossible claims are made. It is true that in their enthusiasm to sell the practitioner a piece of treatment equipment, salesman naturally exaggerate somewhat and this is to be expected,—yet, manufacturers of these treatment devices should see to it that these exuberant salespeople and the quasi-scientists they employ are kept somewhere near the limits of reason when talking at their pseudo-technical gatherings where the apparatus itself is on display.

Instruments are necessary, yet without a thorough understanding of what is to be accomplished in treating a particular case and without a thorough understanding of the possibilities and limitations of the apparatus in question at the moment, it is without a doubt ridiculous to even consider acquiring same.

No optometrist will be successful in any of his treatment work, regardless of the amount of apparatus he has, unless he has also, a fairly clear conception of the underlying causes that make treatments necessary. To merely buy equipment in the hope that somehow this bunch of nuts, bolts, tubes, wheels, etc., can necessarily effect a cure is to court disappointment both on the part of the luckless patient and the practitioner.

We have for years been advocating treatment work on squint cases, amblyopic cases and the like, yet we have always stressed the need of thorough knowledge of the subject itself, before starting the work. The mere acquisition of equipment is a poor substitute for knowledge.

C. C. K.

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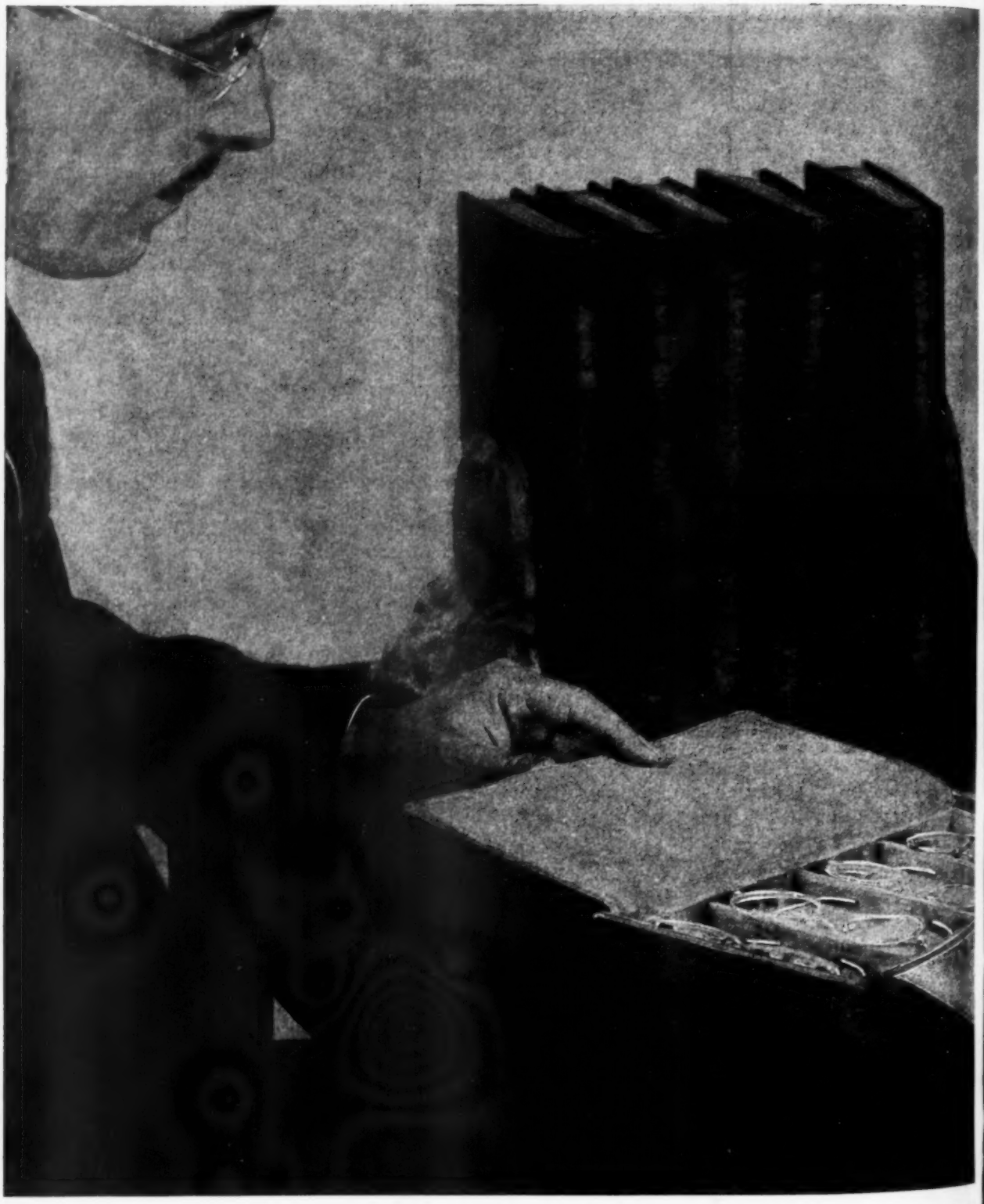
J. J. BAUSCH-HENRY LOMB BUILDING DEDICATED

The new building which will house the optometry school and the Department of Applied Optics at Rochester University was officially dedicated on July 25th. This building will be known as the J. J. Bausch-Henry Lomb Memorial Building, in honor of these men who founded the firm of Bausch and Lomb. The building itself, completely equipped, is a gift to the University by the Bausch and Lomb Optical Company and the Eastman Kodak Company.

COMPLETE



BAUSCH & LOMB OPTICAL CO., Rochester, N. Y.